

What is claimed is:

1. A method of treating tissue fibrosis in a mammalian subject, said method comprising administering a therapeutically effective amount of a pharmaceutical composition comprising a protein and a pharmaceutically acceptable carrier, wherein said protein comprises an amino acid sequence selected from the group consisting of:

- (a) the amino acid sequence of SEQ ID NO:2;
- (b) the amino acid sequence of SEQ ID NO:2 from amino acids 22 to 334;
- (c) the amino acid sequence of SEQ ID NO:2 from amino acids 357 to 383;
- (d) the amino acid sequence of SEQ ID NO:4;
- (e) the amino acid sequence of SEQ ID NO:4 from amino acids 26 to 341;
- (f) the amino acid sequence of SEQ ID NO:4 from amino acids 363 to 380; and
- (g) fragments of (a)-(f) having a biological activity of the IL-13 receptor binding chain..

2. The method of claim 1 wherein said tissue fibrosis affects a tissue selected from the group consisting of liver, skin epidermis, skin endodermis, muscle, tendon, cartilage, cardiac tissue, pancreatic tissue, lung tissue, uterine tissue, neural tissue, testis, ovary, adrenal gland, artery, vein, colon, small intestine, biliary tract and gut.

3. The method of claim 2 wherein said tissue is liver.

4. The method of claim 2 wherein said fibrosis is that resulting from infection with schistosoma.

5. The method of claim 1 wherein said fibrosis is that resulting from healing of a wound.

6. A method of inhibiting formation of tissue fibrosis in a mammalian subject, said method comprising administering a therapeutically effective amount of a pharmaceutical composition comprising a protein and a pharmaceutically acceptable carrier, wherein said protein comprises an amino acid sequence selected from the group consisting of:

- (a) the amino acid sequence of SEQ ID NO:2;
- (b) the amino acid sequence of SEQ ID NO:2 from amino acids 22 to 334;
- (c) the amino acid sequence of SEQ ID NO:2 from amino acids 357 to 383;
- (d) the amino acid sequence of SEQ ID NO:4;
- (e) the amino acid sequence of SEQ ID NO:4 from amino acids 26 to 341;
- (f) the amino acid sequence of SEQ ID NO:4 from amino acids 363 to 380; and
- (g) fragments of (a)-(f) having a biological activity of the IL-13 receptor binding chain..

7. The method of claim 6 wherein said tissue fibrosis affects a tissue selected from the group consisting of liver, skin epidermis, skin endodermis, muscle, tendon, cartilage, cardiac tissue, pancreatic tissue, lung tissue, uterine tissue, neural tissue, testis, ovary, adrenal gland, artery, vein, colon, small intestine, biliary tract and gut.

8. The method of claim 7 wherein said tissue is liver.

9. The method of claim 7 wherein said fibrosis is that resulting from infection with schistosoma.

10. The method of claim 6 wherein said fibrosis is that resulting from healing of a wound.

11. The method of claim 10 wherein said wound is a surgical incision.

12. The method of claim 5 wherein said wound is a surgical incision.

13. A method of treating tissue fibrosis in a mammalian subject, said method comprising administering a therapeutically effective amount of a composition comprising (a) a molecule selected from the group consisting of an IL-13 antagonist and an IL-4 antagonist, and (b) a pharmaceutically acceptable carrier.

14. The method of claim 13 wherein said antagonist is selected from the group consisting of an IL-13bc protein, a soluble form of IL-13R $\alpha$ 1, an antibody to IL-13 or an IL-13-binding fragment thereof, an antibody to IL-13bc or an IL-13bc-binding fragment thereof, an antibody to IL-13R $\alpha$ 1 or an IL-13R $\alpha$ 1-binding fragment thereof, IL-13R-binding mutants of IL-4, a small molecule capable of inhibiting the interaction of IL-13 with IL-13bc and a small molecule capable of inhibiting the interaction of IL-13 with IL-13R $\alpha$ 1.

15. The method of claim 14 wherein said IL-13bc protein is a protein comprising an amino acid sequence selected from the group consisting of:

- (a) the amino acid sequence of SEQ ID NO:2;
- (b) the amino acid sequence of SEQ ID NO:2 from amino acids 22 to 334;
- (c) the amino acid sequence of SEQ ID NO:2 from amino acids 357 to 383;
- (d) the amino acid sequence of SEQ ID NO:4;
- (e) the amino acid sequence of SEQ ID NO:4 from amino acids 26 to 341;
- (f) the amino acid sequence of SEQ ID NO:4 from amino acids 363 to 380; and
- (g) fragments of (a)-(f) having a biological activity of the IL-13 receptor binding chain.

16. The method of claim 13 wherein said tissue fibrosis affects a tissue selected from the group consisting of liver, skin epidermis, skin endodermis, muscle, tendon, cartilage, cardiac tissue, pancreatic tissue, lung tissue, uterine tissue, neural tissue, testis, ovary, adrenal gland, artery, vein, colon, small intestine, biliary tract and gut.

17. The method of claim 16 wherein said tissue is liver.

18. The method of claim 17 wherein said fibrosis is that resulting from infection with schistosoma.

19. The method of claim 13 wherein said fibrosis is that resulting from healing of a wound.

20. The method of claim 19 wherein said wound is a surgical incision.

21. A method of inhibiting formation of tissue fibrosis in a mammalian subject, said method comprising administering a therapeutically effective amount of a composition comprising (a) a molecule selected from the group consisting of an IL-13 antagonist and an IL-4 antagonist, and (b) a pharmaceutically acceptable carrier.

22. The method of claim 21 wherein said antagonist is selected from the group consisting of an IL-13bc protein, a soluble form of IL-13R $\alpha$ 1, an antibody to IL-13 or an IL-13-binding fragment thereof, an antibody to IL-13bc or an IL-13bc-binding fragment thereof, an antibody to IL-13R $\alpha$ 1 or an IL-13R $\alpha$ 1-binding fragment thereof, IL-13R-binding mutants of IL-4, a small molecule capable of inhibiting the interaction of IL-13 with IL-13bc and a small molecule capable of inhibiting the interaction of IL-13 with IL-13R $\alpha$ 1.

23. The method of claim 22 wherein said IL-13bc protein is a protein comprising an amino acid sequence selected from the group consisting of:

- (a) the amino acid sequence of SEQ ID NO:2;
- (b) the amino acid sequence of SEQ ID NO:2 from amino acids 22 to 334;
- (c) the amino acid sequence of SEQ ID NO:2 from amino acids 357 to 383;
- (d) the amino acid sequence of SEQ ID NO:4;
- (e) the amino acid sequence of SEQ ID NO:4 from amino acids 26 to 341;
- (f) the amino acid sequence of SEQ ID NO:4 from amino acids 363 to 380; and

(g) fragments of (a)-(f) having a biological activity of the IL-13 receptor binding chain.

24. The method of claim 21 wherein said tissue fibrosis affects a tissue selected from the group consisting of liver, skin epidermis, skin endodermis, muscle, tendon, cartilage, cardiac tissue, pancreatic tissue, lung tissue, uterine tissue, neural tissue, testis, ovary, adrenal gland, artery, vein, colon, small intestine, biliary tract and gut.

25. The method of claim 24 wherein said tissue is liver.

26. The method of claim 25 wherein said fibrosis is that resulting from infection with schistosoma.

27. The method of claim 21 wherein said fibrosis is that resulting from healing of a wound.

28. The method of claim 27 wherein said wound is a surgical incision.

29. The method of claim 21 wherein said antagonist is selected from the group consisting of a soluble form of IL-4R, an antibody to IL-4 or an IL-4-binding fragment thereof, an antibody to IL-4R or an IL-4R-binding fragment thereof, and a small molecule capable of inhibiting the interaction of IL-4 with IL-4R.

30. The method of claim 13 wherein said antagonist is selected from the group consisting of a soluble form of IL-4R, an antibody to IL-4 or an IL-4-binding fragment thereof, an antibody to IL-4R or an IL-4R-binding fragment thereof, and a small molecule capable of inhibiting the interaction of IL-4 with IL-4R.